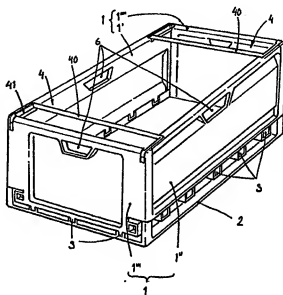




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/SE99/01972 (22) International Filing Date: 3 November 1999 (03.11.99) (30) Priority Date: 9803796-3 6 November 1998 (06.11.98) SE (71) Applicant (for all designated States except US): PERSTORP PLASTIC SYSTEMS AB [SE/SE]; S-284 80 Perstorp (SE). (72) Inventor; and (75) Inventor/Applicant (for US only): VARFELDT, Rasmus [SE/SE]; Hålsövägen 7, S-252 21 Helsingborg (SE). (74) Agent: STENBERG, Yngve; Perstorp AB, S-284 80 Perstorp (SE).	(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  Published With international search report. In English translation (filed in Swedish).	

(54) Title: COLLAPSIBLE TRANSPORT CONTAINER



## (57) Abstract

Collapsible container for transport and storage comprising a base section (2) for inwards collapsible side walls (1), which (1, 2) preferably are manufactured through injection moulding of thermoplastic material. The side walls (1) are movably attached to the base section (2) via hinges (3). Two side walls (1), placed on opposite sides, preferably short side walls (1' and 1'') are provided with, each one, movably attached locking device (4). The locking device (4) is revolved around a pivot axle (12) and is used for holding the side walls (1) together.

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### Collapsible transport container

The present invention relates to a collapsible transport container for transport and storage.

Containers made of different materials such as wood, metal, plastic material etc. are commonly used nowadays. One problem with these containers is that they often demand the same amount of transport space when transported back to the source.

An alternative to returning the container is a so called one way package which is disposed of when it has served its purpose.

Another common way to solve the problem is to provide the container with a so called nesting function. This implies that empty containers are placed partly in one another by providing its side walls with an inclination

Yet another way to solve the problem is to dismount or fold the side walls of the containers. The most common type of side wall dismantling is the pallet and pallet collar. An example of a common container with foldable side walls is the collapsible pallet container. The side walls are here made foldable by being attached to the base a hinge.

A disadvantage with collapsible containers is that they will have to be provided with some type of locking device which keeps the side walls together when erected so that the load absorption capacity and the stability isn't deteriorated. These are, to different degrees, difficult to operate which results in a large amount of time consumed when handled.

A collapsible container, where the handling of the container is considerably simplified, has been achieved through the present invention. Accordingly, the invention relates to a collapsible container for transport and storage, comprising a base section and four inwards collapsible side walls. The different parts are preferably manufactured through injection moulding of a thermoplastic material. It is also possible to manufacture the different parts by utilising for example press moulding, blow moulding or rotation moulding. The side walls are moveably attached to the base section via hinges. The invention is characterised in that two walls, placed on opposite sides, preferably the short side walls, are provided with one moveably attached locking device each. The locking device is revolved around a pivot axle. The locking device is used for holding and locking the side walls together. The revolving of the side walls hereby suitably describes an arch V, as seen from the side. This arch V is divided into a locking zone  $V_L$  and a neutral zone

V<sub>F</sub>. The locking device may be turned with maintained locking of the erected side walls, when within the locking zone V<sub>L</sub>. The side walls are detached from each other, when in the neutral zone V<sub>F</sub> and can by choice be folded up and down.

The locking device is preferably constituted by a bail arm member, two cheek members, two pivot members and two locking members, which all together forms a unit.

According to an embodiment of the invention, the bail arm member may be used as a handle when handling the container with the side walls in erected position. This will be advantageous as this handle may be placed within the outer sides of the container. It will hereby be possible for the person who handles the container to instantly grab the handle without having to change grip in cases where the container is stacked together with other containers on for example a pallet and therefore has other containers on one or more sides. Such a stacking will block traditionally placed handles. Folding and erecting the container will also be facilitated as the handles used for moving and carrying the container also are used for controlling the locking devices. It is consequently not necessary to change grip when for example folding a container according to the invention.

The bail arm member is suitably constituting a support for containers placed on top of the container.

The invention is further illustrated together with enclosed figures showing one and the same embodiment of the invention whereby,

-figure 1 shows, in perspective view, a collapsible container according to the invention.

-figure 2, schematically, shows a part of a collapsible container according to the invention.

Figure 1 shows an embodiment of a collapsible container according to the invention. The collapsible container comprises a base section 2, and four collapsible side walls 1, which parts 1, 2 are manufactured through injection moulding of a thermoplastic material. The side walls 1 are moveably attached to the base section 2 via hinges 3. The two short sides 1''' and 1'''' of the collapsible container are provided with one moveably attached locking device 4 each. The locking devices 4 are revolved around a pivot axle 12 (fig. 2). The locking devices 4 are used for holding and locking the side walls 1 together. The locking devices 4 are each constituted by a bail arm member 40, two cheek members 41, two pivot members 42 (fig. 2) and two locking members 43 (fig. 2), which all together forms

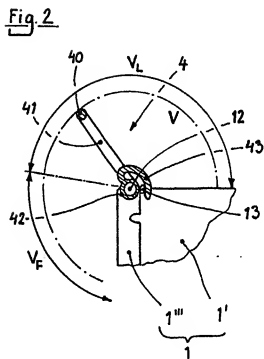
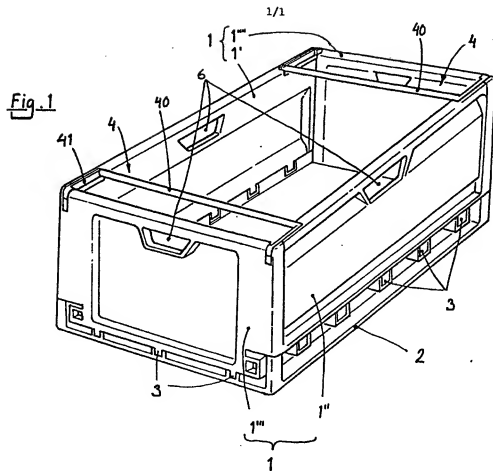
a unit. The bail arm member 40 constitutes a handle when the side walls 1 are erected. The collapsible container is provided with traditional handles 6 which are arranged at the upper edge of the four side walls 1. These handles 6 may possibly be excluded as the bail arm member 4 also can be used as a handle. This can be advantageous in cases where the container is to be used for goods that one of different reasons don't want to get in contact with. As examples of such goods can be mentioned provisions and greasy machine parts. The utilisation of the container volume will also be better if the traditional handles 6 are excluded when the container is used for goods small enough to fall out through the handle holes. The bail arm member 40 can also constitute a support for the base of container placed on top of the container.

Figure 2 shows, schematically, a part of a collapsible container 2 according to the invention. The container part is not shown to scale in order to clarify the function. The short side walls 1''' (fig. 2) and 1'''' (fig. 1) are provided with one moveably attached locking device 4 each. The locking device 4 is revolved around a pivot axle 12 and is used for holding and locking the side walls 1 together (fig. 1). The revolving motion of the locking device 4 describes an arch V which is divided into a locking zone V<sub>L</sub> and a neutral zone V<sub>F</sub>. The locking device 4 can be turned under maintained locking of the erected side walls 1 as long it is in the locking zone V<sub>L</sub>. The side walls 1 are detached from each other in the neutral zone V<sub>F</sub> and can by choice be folded up and down. The locking device 4 is constituted by a bail arm member 40, two cheeks 41, two pivot members 42, and two locking members 43, all constituting a unit. The short side wall 1''' is provided with a pivot axle 12 at each edge. The locking device 4 is moveably arranged on the short side wall 1''' via the pivot members 42 and the pivot axle 12. The other short side wall 1'''' (not shown) is of course also provided with a locking device in a similar manner. The long side walls 1' and 1'' are provided with locking heels 13 on the edges connecting with the short side walls 1''' and 1'''. The locking heels 13 are intended to engage the locking member 43 when these are turned into the locking zone V<sub>L</sub>. The range of the locking zone i. e. the angle, and the range of the neutral zone, i. e. the angle, can be adapted during the design stage, so that it suits the handling the container will be exposed to.

The invention is not limited to the embodiment shown since this can be varied in different way within the scope of the invention. It is for example possible to arrange the locking devices 4 on the long sides 1' and 1'' instead of the short sides 1''' and 1''''.

## CLAIMS

1. Collapsible container for transport and storage comprising a base member (2) and four inwards collapsible side walls (1), which parts (1, 2) preferably are manufactured through injection moulding of a thermoplastic material, whereby the side walls (1) are moveably attached to the base member (2) via hinges (3), characterised in that two side walls (1), placed on opposite sides, preferably two short side walls (1''' and 1'''), are provided with one moveably attached locking device (4) each, which locking device (4) is revolved around a pivot axle (12) and that the locking device (4) is used for holding and locking the side walls (1) together.
2. Collapsible container according to claim 1, characterised in that the revolving motion of the locking device (4) describes an arch (V), which arch (V) is divided into a locking zone (V<sub>L</sub>) and a neutral zone (V<sub>F</sub>), within which locking zone (V<sub>L</sub>) the locking device (4) can be turned with maintained locking of the erected side walls (1) and within which neutral zone (V<sub>F</sub>) the side walls are detached from each other and by choice can be folded up and down.
3. Collapsible container according to claim 1 or 2, characterised in that the locking device (4) is constituted by a bail arm member (40), two cheek member (41), two pivot member (42) and two locking devices (43) which all together forms a unit.
4. Collapsible container according to claim 3, characterised in that the bail arm member (40) constitutes a handle when the side walls (1) are in erected position.
5. Collapsible container according to claim 3 or 4, characterised in that the bail arm member (40) forms a support for a container placed on top of the container.



# INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 99/01972

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: B65D 6/18

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EDOC, WPIL, JAPIO

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SE 210889 C (AB SEPARATOR), 7 February 1967 (07.02.67), figures 1-2, claims 1-2	1,3
A	--	2,4-5
X	GB 2068338 A (MR PIERRE DE LAROSIERE DE CHAMPEU), 12 August 1981 (12.08.81), page 1, line 104 - line 107; page 1, line 125 - line 127, figures 1,4	1,3
A	--	2,4-5

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	<p>WO 9856668 A1 (MCKECHNIE UK LIMITED),  17 December 1998 (17.12.98), page 8,  line 23 - page 9, line 14; page 11,  line 18 - page 12, line 11, figures 5-6, 12a-12c</p> <p>---</p> <p>-----</p>	1-5

# INTERNATIONAL SEARCH REPORT

Information on patent family members

02/12/99

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WO	9856668 A1	17/12/98	AU	8028398 A	30/12/98
			GB	9712151 D	00/00/00
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